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French Agriculture and Climate Change

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Agricultural Situation

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Report Highlights:

Agriculture and related food industries are a major sector of the French economy (totaling 4 percent of GDP), and are therefore a major source of greenhouse gas emissions and fossil fuel consumption. In recent years, there have been significant efforts to reduce energy consumption and greenhouse gas (GHG) emissions, and promote renewable energy use and generation in order to increase sustainability. Such efforts have been the result of policy incentives and various industry initiatives.

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1. Contribution of French Agriculture to Climate Change

French Agriculture's Emissions of Green House Gases (GHGs):

The main GHGs produced by human activity are carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄).

In France, agriculture is the third largest contributor of GHG emissions (19.2 percent of total GHG emissions) after transportation (26.4 percent) and industry (19.9 percent), and before housing (18.6 percent), and the energy industry (13.3 percent).

Almost half of French agriculture's GHG emissions comes from soil – mainly N₂O -- (47 percent), followed by ruminant gastric fermentation – mainly methane – (26 percent), animal waste (18 percent), and energy consumption (9 percent).

Fossil Energy Use by Agriculture:

Direct energy consumption by agriculture represents 2 percent of total French energy consumption (by all industry sectors), and 6 percent of total farm costs. Indirect energy consumption by farms comes from nitrogen consumption. Indirect energy use accounts for 60 percent of the total energy consumption by French farms.

Production of Bioenergies by Agriculture:

France started producing biofuels in the early 90's and is now the second largest producer and consumer of biofuels in the EU-27 after Germany. Growing biodiesel (mainly from rapeseed) and bioethanol (mainly from sugarbeets and wheat) production and consumption is attributable to a series of financial incentives to reach target incorporation levels of 7 percent of fuel use in transportation by 2010.

2. Policy Framework

Grenelle for the Environment:

Almost immediately upon his election in 2007, President Sarkozy initiated comprehensive environmental consultations taking into account a wide range of stakeholders, partially among environmental interests, resulting in a number of “green” objectives covering virtually all sectors, including agriculture. These were incorporated into a law voted on by the French Parliament in 2009. Fighting climate change is the foremost priority of the Grenelle law, with the objectives of a 20 percent reduction in GHG emissions, a 20 percent increase in energy efficiency, and a contribution of renewable energies to 23 percent of total French energy consumption by 2020.

Energy independence on the farm is one of the major factors considered by the Grenelle, which aims to improve energy management so that 30 percent of farms will have reduced energy dependence by 2013. This objective translates into the Energy Performance Plan described below.

French Initiative to Develop an Energy Performance Plan for French Farms: 2009-2013

This five-year program was launched in February 2009, and is part of the French government’s action plan to boost the economy. Its budget is €30 million for 2009. It includes a number of actions to be conducted at the farm level, emphasizing the “energy diagnosis” of farms. The objective is to conduct an energy diagnosis on 100,000 farms by 2013 (out of a total of 326,000 farms in France). Energy performance diagnosis reviews farms direct and indirect energy consumption, identifies room for improvement, and makes recommendations. These may cover practices to reduce energy consumption (e.g., reducing nitrogen input, changing crop management), use of different equipment (e.g., isolation materials, heat economizers), and renewable energy production (mainly methanization and biomass).

French Bioenergy Policy Initiatives

Industrial Biofuels Production:

- To develop the biofuel industry, the French government established in the early 90’s tax rebates for biodiesel and bioethanol relative to diesel and gasoline, with the tax preference rate revised annually. Only plants officially approved by the GOF through a bidding process qualify, up to total quantities of biodiesel and bioethanol eligible for favorable tax rates set every year through 2010.
- Also, fuel blending companies receive favorable tax treatment on a limited quantity of biofuel blended at a targeted incorporation rate set by the French government annually (from 5.75 percent in 2008 to 6.25 percent in 2009 and 7 percent in 2010).

On-Farm Production:

The Energy Performance Plan, described above and launched in February 2009, promotes renewable energy production and use on the farm, where methanization is a priority. Currently, the number of French farms with a methanization process is very limited compared to Germany, and the French Plan aims to facilitate the use of the process, using livestock waste and crop residues. In addition to methanization, the Energy Performance Plan promotes the use of agriculture and forestry biomass in boilers, and the installation of photovoltaic panels and thermo-solar panels on farm roofs.

EU Climate Change Package Aiming to Reduce GHG Emissions

In 2005, the European Union created a market for trading CO₂ emission quotas. A National Allocation Plan for the Allocation of GHG Emission Allowances (Plan National d'Affectation des Quotas – PNAQ) is administered by the French Ministry of Environment.

In 2009, the EU Climate Change Package (CCP) adopted by the EU Council included goals for 2020 to reduce GHG emissions by 20 percent compared to 1990 levels.

The 2009 CCP includes the targets to improve energy efficiency by 20 percent compared to the current expectations for 2020; and to include 20 percent of renewable energies in the EU energy mix. A part of the 20 percent share of renewables is a 10 percent minimum target for biofuels in transport to be observed by all Member States (MS).

3. French Agriculture Addressing Climate Change – Some Examples

French farms are not part of the carbon dioxide emission quota system in place as they are considered to be individually too small and numerous. However, the agrofood industry is integrated in the system both upstream (e.g. fertilizer, animal feed industry) and downstream (e.g. sugar, yeast, biofuels, starch, and dairy industry).

The contribution of French agriculture to GHG emissions declined by 11.5 percent from 1990 to 2006, in line with the 11 percent reduction in nitrogen fertilization. At the same time, methane produced by livestock breeding declined by 6.5 percent, mainly due to the reduction in the national dairy herd.

Reducing Nitrogen Input in Crop Cultivation:

A number of studies are currently being carried out by the National Institute of Research in Agronomy (INRA), French farmer organizations and cooperatives to reduce nitrogen input in crop production, and especially nitrogen in rapeseed production.

Animal Feed:

The French animal feed compounding industry is the largest in the European Union, and therefore a major contributor climate change. Consequently, it is currently exploring ways to increase its energy efficiency and carbon balance. For example, the industry is considering reorganizing the

supply chain to favor farms located close to the animal feed plants; or changing formulations to reduce methane emissions during animal digestion.

An INRA study concluded that methane emissions by dairy cows can be reduced by 30 percent on average if their feed rations include vegetable oils with a high polyunsaturated fatty acids content.

Reducing Fuel Use by Tractors:

There are a number of studies exploring reduce cultivation operations for growing crops, including no-till or simplified crop techniques conducted by INRA and local groups. Also, smaller farmers are accustomed to sharing equipment with their neighbors to contain costs.

Tractors in France tend to over-use fuels, and adjusting fuel consumption to their needs would reduce their fuel consumption by 5 percent, i.e., by 400,000 MT of CO₂ per year. The French Ministry of Environment and local authorities make 600-700 diagnoses of tractors per year, thereby contributing to saving 2.5 MT CO₂ per tractor each year.

Producing Biofuels:

For more details on the French biofuels economy and policy, please see [NL9014](#) dated June 2009, [FR8020](#) dated November 2008, and [FR8012](#) dated July 2008.

France is the second largest producer and consumer of biofuels in the EU-27 after Germany. In 2007, 1.15 million MT of biodiesel and 420,000 MT of bioethanol were consumed in France, representing 3.5 percent of French transport fuel consumption, in line with national objectives. The eventual development of second generation biofuels are expected to contribute to reducing further GHG.

In September 2008, the Futurol second generation biofuel research and development, was officially launched. Futurol's objectives are to develop a process producing bioethanol at a competitive price from a wide range of sources of cellulosic biomass (including farm waste and by-products, forestry biomass, dedicated crops); developing cellulose-extracting technologies, select enzymes and yeasts and elaborate hydrolysis and fermentation processes adapted to each category of raw material; and obtaining the best energy and greenhouse gas balance possible.

Producing Agricultural Goods for Chemistry and Materials:

Currently, approximately 7 percent of the raw materials used by the French chemistry industry is sourced from agriculture, replacing fossil products and therefore contributing to reducing GHG emission. The French chemical company Roquette, a major starch processor, is highly involved in green tech and projects this percentage may increase to 50 percent by 2050. Corn products are increasingly displacing plastic.